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ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D.C. 20231



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RE: Application Serial No.: 09/147,813

Applicants: Jean-Louis BRAVET, et al.

Filing Date: August 31, 1999

For: PLASTIC GLAZING, IN PARTICULAR FOR  
MOTOR CAR AND METHOD FOR MAKING SAME

Group Art Unit: 1773

Examiner: Paulraj

SIR:

Attached hereto for filing are the following papers:

**APPEAL BRIEF (WITH ATTACHED APPENDIX) (IN TRIPLICATE)**

Our check in the amount of \$320.00 is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary Extension of Time to make the filing of the attached documents timely, please charge or credit the difference to our Deposit Account No. 15-0030. Further, if these papers are not considered timely filed, then a petition is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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1247-0796-0V PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF:

JEAN-LOUIS BRAVET ET AL

: EXAMINER: PAULRAJ

SERIAL NO. : 09/147,813

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FILED: AUGUST 31, 1999

: GROUP ART UNIT: 1773

FOR: PLASTIC GLAZING, IN  
PARTICULAR FOR MOTOR  
CAR AND METHOD FOR  
MAKING SAME

:

APPEAL BRIEF

ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D.C. 20231

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TC 1700

SIR:

This is an appeal of the Final Rejection dated December 31, 2001 of Claims 40-65. A Notice of Appeal, along with a petition for a two-month extension of time, was timely filed on May 31, 2002.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Saint-Gobain Vitrage having an address at 18, Avenue D'Alsace, F-92400 Courbevoie, France.

II. RELATED APPEALS AND INTERFERENCES

Appellants, Appellants' legal representative and the assignee are aware of no appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

### III. STATUS OF THE CLAIMS

Claims 40-65, all the claims in the application, stand rejected and are herein appealed.

### IV. STATUS OF THE AMENDMENTS

No amendment under 37 CFR 1.116 has been filed.

### V. SUMMARY OF THE INVENTION

As recited in independent Claim 40, the invention is a glass-free motor vehicle window, which is at least partly transparent, and which meets French standard R43 for motor vehicle windows, which comprises:

- a.) a plastic layer having a thickness of 5 to 10 mm,
- b.) at least one skin layer of a plastic film having a thickness of 10 to 100  $\mu\text{m}$  coated on said plastic layer, and
- c.) a scratch-resistant layer having a thickness of 1 to 10  $\mu\text{m}$  supported by said plastic film,

wherein said window is prepared by the following process (A) or process (B), wherein process (A) comprises:

- 1.) providing said skin layer b.), either flat or in shaped form,
- 2.) subjecting said skin layer to heat treatment, the skin layer, being supported completely or partly by a mould surface, an auxiliary means for shaping at least part of the skin to the said mould surface being optionally provided so as to relax stresses in the skin, and crosslinking constituent elements thereof; and

3.) joining the skin to said plastic layer a.) by hot pressing in a form, or by thermoplastic injection moulding or reactive injection moulding of the material of the plastic layer a.), the skin having been positioned in the bottom of the mould in such a way that a scratch-resistant layer c.) is in direct contact with the mould;

and process (B) comprises:

1.) depositing the constituent elements of a scratch-resistant layer on a substantially flat plastic film; and

2.) shaping said film bearing the elements of the scratch-resistant layer into a shape which is the same as or at least similar to the ultimate shape of the end-product, while at the same time at least partly crosslinking the scratch-resistant layer.

See original Claims 1 and 11-12, and the specification at page 3, lines 1-7 and 23-29; page 4, lines 3-5 and 25-26.

## VI. ISSUES

Whether the claims are unpatentable under 35 U.S.C. §103(a) for the following reasons:

(A) Claims 40-45, 49, 52, 62, and 63 over U.S. 4,112,171 (Motter et al) in view of U.S. 5,525,401 (Hirmer);

(B) Claims 46 and 47 over Motter et al in view of Hirmer, and further in view of U.S. 5,849,414 (Bier et al);

(C) Claims 48, 50 and 51 over Motter et al in view of Hirmer, and further in view of U.S. 4,634,637 (Oliver et al);

(D) Claims 53-61 over Motter et al in view of Hirmer, and further in view of U.S. 4,386,042 (Tatebayashi); and

(E) Claims 44 and 63-65 over Motter et al in view of Hirmer, and further in view of EP-A1-0524417 (EP '417) and EP-A1-0718348 (EP '348)?

## VII. GROUPING OF THE CLAIMS

The claims all stand or fall separately.

## VIII. ARGUMENT

All the claims stand rejected under 35 U.S.C. §103(a) over the prior art listed above. The rejections are untenable and should not be sustained.

The invention relates to a glass-free motor vehicle window, which is at least partly transparent, and which meets French standard R43 for motor vehicle windows, and of optical quality equivalent to a window, which comprises:

- a.) a plastic layer having a thickness of 5 to 10 mm,
  - b.) at least one skin layer of a plastic film having a thickness of 10 to 100  $\mu\text{m}$  coated on said plastic layer, and
  - c.) a scratch-resistant layer having a thickness of 1 to 10  $\mu\text{m}$  supported by said plastic film,
- and made by one of two processes as recited; as well as to each of these processes.

Motter et al is concerned with problems arising from protecting a glass substrate for automotive glazing with a plastic cover or shield (column 1, line 43 through the end of column 2). Motter et al disclose that their invention makes it possible to provide automobile

glazings have such a protective cover or shield over an inboard glass surface that, in addition to inhibiting lacerative injuries, will not be adversely affected by exposure to the atmosphere, is unaffected by extreme cold, is clearly transparent and practically color free, does not adversely affect the Severity Index of the complete structure, and is highly resistant to marking, scratching, marring and abrasion (column 3, lines 1-11). While almost the entire disclosure of Motter et al is with regard to a structure which uses a glass-containing substrate, Motter et al does disclose that the substrate may be an "all-plastic structure" (column 1, line 38). However, Motter et al contains no further disclosure regarding the all-plastic structure, such as number of layers, substrate thickness, materials, etc. Moreover, one skilled in the art reading Motter et al would be without a clue as to problems associated with the use of an all-plastic structure. Hirmer is concerned with a vehicle window comprising a relatively thin sheet of clear plastic material having opposed surfaces, and electrically operable defrosting grid adhered to one surface of the relatively thin sheet, and a relatively thick substrate layer of clear plastic having opposed surfaces curved into a vehicle window configuration. The relatively thick substrate layer is adhered to the one surface of the relatively thin sheet and the electrically operable defrosting grid adhered thereto while in contact therewith in a molten state under heat and pressure within a cavity defined by two generally parallel curved dye surfaces of cooperating injection molding dyes so that upon solidification the surfaces of the relatively thin sheet are retained in a curved configuration in generally parallel coextensive relation to corresponding curved surfaces of the relatively thick substrate layer. The relatively thin sheet is disclosed to have a thickness of 5 to 40 mils (column 3, lines 10-12), which is the same as 127  $\mu\text{m}$ -1,016  $\mu\text{m}$ , and the relatively thick substrate layer is

disclosed to have a thickness of 50 to 500 mils (column 3, lines 53-54), which is the same as 1.27 to 12.7 mm.

The Examiner asserts that it would have been obvious to use the plastic substrate of Hirmer with its disclosed thickness, in place of the glass substrate of Motter et al.

However, it is not clear why one skilled in the art would make this substitution without the present disclosure as a guide. Why, for example, would one skilled in the art not also incorporate the relatively thin sheet of Hirmer, which has a thickness, as discussed above, which is greater than both the presently-recited at least one skin layer and said scratch-resistant layer? It is clear that the Examiner has selected from Hirmer only that which supports the rejection, without considering the reference as a whole.

Moreover, all of the present product claims are now product-by-process claims. Even if one skilled in the art would have combined Motter et al and Hirmer, as suggested by the Examiner, why would one skilled in the art have done so using the presently-recited process steps?

In the Office Action dated June 14, 2001, in response to the above argument that it is not clear why one skilled in the art would use the plastic substrate of Hirmer with its disclosed thickness in place of the glass substrate of Motter et al, without the present disclosure as a guide, the Examiner points to column 1, lines 22-25 of Hirmer, which discloses that it is well known that plastic materials, such as polycarbonates, if employed in lieu of glass, could reduce the weight of a glass rear window. However, Hirmer goes on to disclose, which the Examiner does not comment on, that nevertheless, glass continues to be used because it is apparent that in order for motor vehicle makers to shift from glass to plastics, the plastic window must be cost effective in other ways besides weight reduction

(column 1, lines 25-28). Thus, the Examiner has extracted from Hirmer only that disclosure which supports his rejection, without considering the reference as a whole. This is improper. See *In re Ehrreich*, 200 USPQ 504 (CCPA 1979), which proscribes picking and choosing isolated teachings in the art and requires consideration of "the entirety of the disclosure made by the references" in any evaluation under 35 U.S.C. §103.

The Examiner dismisses the above arguments with regard to differences in thickness by citing *In re Rose*, 105 USPQ 237 (CCPA 1955) for the proposition that a change in size is generally recognized as being within the level of ordinary skill in the art. In the pre-1952 case of *Rose*, the CCPA found that a claim limitation requiring that bundle of lumber be of such size and weight requiring handling by a lift truck did not distinguish over prior art disclosing such a bundle that could be lifted by hand, stating that the size of an article "is not **ordinarily** a matter of invention" (emphasis added.) 105 USPQ at 240. Thus, even if *Rose* is applicable precedent today, it is not an absolute rule. Moreover, were it clear that the prior art disclosed or suggested that a glass substrate could be substituted with a plastic substrate to obtain a functionally similar article without consideration of any factors except weight, then the Examiner might have a point as to the obviousness of making the substitution. However, there is no such disclosure or suggestion in the art, and it is clear from the above-discussed disclosure in Hirmer that simply replacing a glass substrate with a plastic substrate involves consideration of other factors.

In response to Applicants' argument that the present claims are product-by-process claims, the Examiner asserts that the product nevertheless appears to be the same as or obvious from a product of the prior art. However, Applicants disclose in the specification beginning at page 7, line 24 the advantages in the final product formed when made from



either of the recited processes herein. These properties are necessarily inherent in the product. The Examiner has not established that a product based on the above-combination of prior art references would have these properties.

In the Final Office Action, the Examiner tries to distinguish the present facts from those of *Ehrreich*. Nevertheless, the Examiner has still not explained why one skilled in the art would not also incorporate the relatively thin sheet of Hirmer if substituting for the glass substrate of Motter et al. The Examiner then, without any supporting evidence, finds that one skilled in the art would have had the skills and knowledge to replace glass with plastic. This is rather surprising because given the advantages of plastic over glass, judicial notice can be taken of the fact that today, the predominant substrate for motor vehicle windows is glass, not plastic.

Claim 41 is separately patentable, since the combination of Motter et al and Hirmer neither disclose nor suggest the glass-free motor vehicle window according to Claim 40, wherein plastic layer a.) comprises a thermoplastic, comprising polycarbonate, poly(methylmethacrylate), an ethylene/vinyl acetate copolymer, poly(ethylene terephthalate), polyurethane or a cycloolefin copolymer, or an ionomer resin or a thermosetting or thermally crosslinkable material of a polyurethane, unsaturated polyester or ethylene/vinyl acetate copolymer, or a combination of several thicknesses of the same or several of these plastics.

Claim 42 is separately patentable, since the combination of Motter et al and Hirmer neither disclose nor suggest the glass-free motor vehicle window according to Claim 40, wherein skin layer b.) comprises of one or more transparent thermoformable plastic films made of polycarbonate, polypropylene, poly(methyl methacrylate), an ethylene/vinyl acetate

copolymer, poly(ethylene terephthalate), polyurethane, polyvinyl butyral or a cycloolefin copolymer.

Claim 43 is separately patentable, since the combination of Motter et al and Hirmer neither disclose nor suggest the glass-free motor vehicle window according to Claim 42, wherein interposed between plastic films (b.) or deposited on plastic film b), is at least one functional layer.

Claim 44 is separately patentable, since the combination of Motter et al and Hirmer neither disclose nor suggest the glass-free motor vehicle window according to Claim 40, wherein scratch-resistant layer c.) is inorganic, or consists essentially of networks of entangled inorganic and organic molecular chains linked to each other by silicon-carbon bonds.

Claim 45 is separately patentable, since the combination of Motter et al and Hirmer neither disclose nor suggest the glass-free motor vehicle window according to Claim 44, wherein inorganic scratch-resistant layer c.) consists essentially of polysiloxanes, silica or alumina.

Claim 49 is separately patentable, since the combination of Motter et al and Hirmer neither disclose nor suggest the glass-free motor vehicle window according to Claim 40, including at least one adhesion layer between layer a.) and layer b.).

Claim 52 is separately patentable, since the combination of Motter et al and Hirmer neither disclose nor suggest the glass-free motor vehicle window according to Claim 40, wherein scratch resistant layer c.) has a surface appearance without any crazing.

Claim 62 is separately patentable, since the combination of Motter et al and Hirmer neither disclose nor suggest a method of incorporating a body element, at least a portion of

which is transparent, in a manufactured object, which comprises incorporating the glass-free automobile window according to Claim 40, into an automobile.

Claim 63 is separately patentable, since the combination of Motter et al and Hirmer neither disclose nor suggest a glass-free motor vehicle window, which is at least partly transparent, and which meets French standard R43 for motor vehicle windows, which comprises:

- a.) a plastic layer having a thickness of 5 to 10 mm,
- b.) at least one skin layer of a plastic film having a thickness of 10 to 100  $\mu\text{m}$  coated on said plastic layer, and
- c.) a scratch-resistant layer having a thickness of 1 to 10  $\mu\text{m}$  supported by said plastic film,

wherein scratch-resistant layer c.) is essentially inorganic or consists essentially of networks of entangled inorganic and organic molecular chains linked to each other by silicon-carbon bonds.

Bier et al disclose a coating for polycarbonate molded parts obtained by hydrolytic polycondensation of an aluminum compound of an organofunctional silane and oxide compound, inclusive of fluorinated silanes disclosed as imparting hydrophobic properties and particularly good resistance to condensed water. Without the present disclosure as a guide, it is not clear why one skilled in the art would have combined Motter et al and Hirmer with Bier et al. Nevertheless, Bier et al do not remedy the basic deficiencies in the combination of Motter et al and Hirmer, as discussed above.

Thus, Claim 46 is separately patentable, since the combination of Motter et al, Hirmer and Bier et al neither disclose nor suggest the glass-free motor vehicle window according to

Claim 40, wherein an external layer of said glass-free motor vehicle window comprises a hydrophobic/oleophobic agent which is incorporated into said scratch-resistant layer c.), grafted onto said scratch-resistant layer c.), or self-supported on a film of poly(vinylfluoride) or poly(vinylidene fluoride) applied directly to said scratch-resistant layer c.).

Claim 47 is separately patentable, since the combination of Motter et al, Hirmer and Bier et al neither disclose nor suggest the glass-free motor vehicle window according to Claim 40, wherein the hydrophilic/oleophilic agent is obtained from precursor silanes having a hydrolyzable alkoxy- or halo-functional group at one end and a perfluorinated carbon chain at the other end.

Oliver et al disclose a solar control film having various layers. The Examiner relies on Oliver et al for its disclosure of optically selective metal layers separated by dielectric layers, as well as decorative layers. Again, it is not clear why one skilled in the art would combine Oliver et al with Motter et al and Hirmer in the absence of Applicants' disclosure. Nevertheless, Oliver et al do not remedy the basic deficiencies of Motter et al combined with Hirmer, as discussed above.

Thus, Claim 48 is separately patentable, since the combination of Motter et al, Hirmer and Oliver et al neither disclose nor suggest the glass-free motor vehicle window according to Claim 40, wherein skin layer b) includes at least one decorative or masking layer or both covering all or part of the surface of the window.

Claim 50 is separately patentable, since the combination of Motter et al, Hirmer and Oliver et al neither disclose nor suggest the glass-free motor vehicle window according to Claim 40, wherein skin layer b.) includes one or more optically selective layers, having

thicknesses of between 2 and 35  $\mu\text{m}$  and separated from each other, as well as from other adjacent layers or films, by dielectric layers.

Claim 51 is separately patentable, since the combination of Motter et al, Hirmer and Oliver et al neither disclose nor suggest the glass-free motor vehicle window according to Claim 40, wherein the optically selective layers are metal layers.

Tatebayashi discloses molding a synthetic resin article having a hard coating. As clear from the disclosure of applicable materials in Tatebayashi, such as transparent windows for meters or clocks, Tatebayashi is concerned with relatively small articles in comparison to motor vehicle windows. See, for example, Example 2, which involves coating a lens with a diameter of 50 mm. Why, without the present disclosure as a guide, would one skilled in the art use the process of Tatebayashi to make **any** motor vehicle window, let alone the presently-claimed window? Nor does Tatebayashi disclose the particulars of the recited process steps.

With regard to process Claims 53-61 and the disclosure in Tatebayashi, the Examiner again cites *Rose, supra*, for the proposition that a change in size is generally recognized as being within the level of ordinary skill in the art, and that one skilled in the art would have found it obvious to "scale up" the production process to make larger articles. In reply, the fact situation is quite different from that in *Rose*, as discussed above. In addition, the Examiner's conclusion is based on no fact-finding. Can the Examiner identify **any** process used for making windows on the order of 50 mm in diameter that has also been used to make windows of a size for making motor vehicle windows? The Examiner's rationale is nothing more than "obvious to try," without any reasonable predictability of success.

"Obvious to try" has long been held not to constitute obviousness. *In re O'Farrell*, 853 F.2d 894, 903, 7 USPQ2d 1673, 1680-81 (Fed. Cir. 1988). A general incentive does not make obvious a particular result, nor does the existence of techniques by which those efforts can be carried out. *In re Deuel*, 34 USPQ2d 1210, 1216 (Fed. Cir. 1995).

In the Final Office Action, the Examiner finds that Tatebayashi does not particularly limit the size of the structures that can be made using his process. In reply, regardless, one skilled in the art would not extrapolate a process for making structures of the order of 50 mm to one for making motor vehicle windows.

Thus, Claim 53 is separately patentable, since the combination of Motter et al, Hirmer and Tatebayashi neither disclose nor suggest a process for preparing a glass-free automobile window which is at least partly transparent, and which meets French standard R43 for motor vehicle windows, which comprises:

- a.) a plastic layer having a thickness of 5 to 10 mm,
- b.) at least one skin layer of a plastic film having a thickness of 10 to 100  $\mu\text{m}$  coated on said plastic layer, and
- c.) a scratch-resistant layer having a thickness of 1 to 10  $\mu\text{m}$  supported by said plastic film, which process comprises:
  - 1.) providing said skin layer b.), either flat or in shaped form,
  - 2.) subjecting said skin layer to heat treatment, the skin layer, being supported completely or partly by a mould surface, an auxiliary means for shaping at least part of the skin to the said mould surface being optionally provided so as to relax stresses in the skin, and crosslinking constituent elements thereof; and

3.) joining the skin to said plastic layer a.) by hot pressing in a form, or by thermoplastic injection moulding or reactive injection moulding of the material of the plastic layer a.), the skin having been positioned in the bottom of the mould in such a way that a scratch-resistant layer c.) is in direct contact with the mould.

Claim 54 is separately patentable, since the combination of Motter et al, Hirmer and Tatebayashi neither disclose nor suggest the process of Claim 53, wherein the constituent elements are supplied by screen printing, flexography, ink jet printing, laser printing, dip coating or spraying.

Claim 55 is separately patentable, since the combination of Motter et al, Hirmer and Tatebayashi neither disclose nor suggest the process of Claim 53, wherein in step 2), the heat treatment is effected at 100° to 300°C.

Claim 56 is separately patentable, since the combination of Motter et al, Hirmer and Tatebayashi neither disclose nor suggest a process for preparing a glass-free automobile window which is at least partly transparent, and which meets French standard R43 for motor vehicle windows, which comprises:

- a.) a plastic layer having a thickness of 5 to 10 mm,
- b.) at least one skin layer of a plastic film having a thickness of 10 to 100 µm coated on said plastic layer, and
- c.) a scratch-resistant layer having a thickness of 1 to 10 µm supported by said plastic film, which process comprises:

1.) depositing the constituent elements of a scratch-resistant layer on a substantially flat plastic film; and

2.) shaping said film bearing the elements of the scratch-resistant layer into a shape which is the same as or at least similar to the ultimate shape of the end-product, while at the same time at least partly crosslinking the scratch-resistant layer.

Claim 57 is separately patentable, since the combination of Motter et al, Hirmer and Tatebayashi neither disclose nor suggest the process of Claim 56, wherein the crosslinking and simultaneous shaping involve a heat treatment at a temperature of from 100 and 300°C.

Claim 58 is separately patentable, since the combination of Motter et al, Hirmer and Tatebayashi neither disclose nor suggest the process of Claim 57, wherein the temperature is from 140 to 240°C.

Claim 59 is separately patentable, since the combination of Motter et al, Hirmer and Tatebayashi neither disclose nor suggest the process of Claim 56, wherein the shaping is carried out by supporting the film coated with the scratch-resistant layer, or the elements intended to constitute this layer, at least on part of its surface, by a mould.

Claim 60 is separately patentable, since the combination of Motter et al, Hirmer and Tatebayashi neither disclose nor suggest the process of Claim 56, wherein the mould carrying the film is a frame open at its center.

Claim 61 is separately patentable, since the combination of Motter et al, Hirmer and Tatebayashi neither disclose nor suggest the process of Claim 56, wherein the film coated with the scratch-resistant layer of elements constituting this layer is combined, before shaping, with one or more other films which themselves fulfill functions or carry means for carrying out these functions other than the scratch-resistance function.

Each of Claim 44 and Claims 63-65 are separately patentable. The Examiner appears to rely on the disclosure of a cured organopolysiloxane compound in Motter et al at column



4, lines 30-34 to meet the terms of Claim 44. (Note that Claims 44 and 63 have also been rejected over Motter et al and Hirmer alone.) The subject matter of these claims is described in the specification at the paragraph bridging pages 4 and 5 and provides especially advantageous results. The subject matter of Claims 44, and 63-65 is not simply a cured organopolysiloxane compound. Neither Motter et al, alone or combined with the other applied prior art, disclose or suggest the subject matter of these claims.

Thus, Claim 44 is separately patentable, since the combination of Motter et al, Hirmer, EP '417 and EP '348 neither disclose nor suggest the glass-free motor vehicle window of Claim 40, wherein said scratch-resistant layer c.) is inorganic, or consists essentially of networks of entangled inorganic and organic molecular chains linked to each other by silicon-carbon bonds.

Claim 63 is separately patentable, since the combination of Motter et al, Hirmer, EP '417 and EP '348 neither disclose nor suggest a glass-free motor vehicle window, which is at least partly transparent, and which meets French standard R43 for motor vehicle windows, which comprises:

- a.) a plastic layer having a thickness of 5 to 10 mm,
- b.) at least one skin layer of a plastic film having a thickness of 10 to 100  $\mu\text{m}$  coated on said plastic layer, and
- c.) a scratch-resistant layer having a thickness of 1 to 10  $\mu\text{m}$  supported by said plastic film,

wherein the scratch-resistant layer c.) is essentially inorganic or consists essentially of networks of entangled inorganic and organic molecular chains linked to each other by silicon-carbon bonds.

Claim 64 is separately patentable, since the combination of Motter et al, Hirmer, EP '417 and EP '348 neither disclose nor suggest the glass-free motor vehicle window of Claim 63, wherein the scratch-resistant layer c.) consists essentially of networks of entangled inorganic and organic molecular chains linked to each other by silicon-carbon bonds.

Claim 65 is separately patentable, since the combination of Motter et al, Hirmer, EP '417 and EP '348 neither disclose nor suggest the glass-free motor vehicle window of Claim 64, wherein said networks of entangled inorganic and organic molecular chains linked to each other by silicon-carbon bonds are provided by an Ormocer varnish.

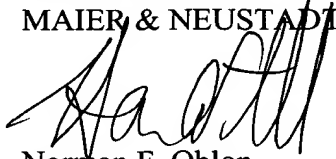
Accordingly, it is respectfully requested that the rejections be REVERSED.

IX. CONCLUSION

For the above reasons, it is respectfully requested that all the rejections still pending in the Final Office Action be REVERSED.

Respectfully submitted,

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## APPENDIX

### CLAIMS ON APPEAL

40. A glass-free motor vehicle window, which is at least partly transparent, and which meets French standard R43 for motor vehicle windows, which comprises:

- a.) a plastic layer having a thickness of 5 to 10 mm,
- b.) at least one skin layer of a plastic film having a thickness of 10 to 100  $\mu\text{m}$  coated on said plastic layer, and
- c.) a scratch-resistant layer having a thickness of 1 to 10  $\mu\text{m}$  supported by said plastic film,

wherein said window is prepared by the following process (A) or process (B), wherein process (A) comprises:

- 1.) providing said skin layer b.), either flat or in shaped form,
- 2.) subjecting said skin layer to heat treatment, the skin layer, being supported completely or partly by a mould surface, an auxiliary means for shaping at least part of the skin to the said mould surface being optionally provided so as to relax stresses in the skin, and crosslinking constituent elements thereof; and
- 3.) joining the skin to said plastic layer a.) by hot pressing in a form, or by thermoplastic injection moulding or reactive injection moulding of the material of the plastic layer a.), the skin having been positioned in the bottom of the mould in such a way that a scratch-resistant layer c.) is in direct contact with the mould;

and process (B) comprises:

1.) depositing the constituent elements of a scratch-resistant layer on a substantially flat plastic film; and

2.) shaping said film bearing the elements of the scratch-resistant layer into a shape which is the same as or at least similar to the ultimate shape of the end-product, while at the same time at least partly crosslinking the scratch-resistant layer.

41. The glass-free motor vehicle window according to Claim 40, wherein said plastic layer a.) comprises a thermoplastic, comprising polycarbonate, poly(methylmethacrylate), an ethylene/vinyl acetate copolymer, poly(ethylene terephthalate), polyurethane or a cycloolefin copolymer, or an ionomer resin or a thermosetting or thermally crosslinkable material of a polyurethane, unsaturated polyester or ethylene/vinyl acetate copolymer, or a combination of several thicknesses of the same or several of these plastics.

42. The glass-free motor vehicle window according to Claim 40, wherein said skin layer b.) comprises of one or more transparent thermoformable plastic films made of polycarbonate, polypropylene, poly(methyl methacrylate), an ethylene/vinyl acetate copolymer, poly(ethylene terephthalate), polyurethane, polyvinyl butyral or a cycloolefin copolymer.

43. The glass-free motor vehicle window according to Claim 42, wherein interposed between plastic films (b.) or deposited on said plastic film b), is at least one functional layer.

44. The glass-free motor vehicle window according to Claim 40, wherein said scratch-resistant layer c.) is inorganic, or consists essentially of networks of entangled inorganic and organic molecular chains linked to each other by silicon-carbon bonds.

45. The glass-free motor vehicle window according to Claim 44, wherein said inorganic scratch-resistant layer c.) consists essentially of polysiloxanes, silica or alumina.

46. The glass-free motor vehicle window according to Claim 40, wherein an external layer of said glass-free motor vehicle window comprises a hydrophobic/oleophobic agent which is incorporated into said scratch-resistant layer c.), grafted onto said scratch-resistant layer c.), or self-supported on a film of poly(vinylfluoride) or poly(vinylidene fluoride) applied directly to said scratch-resistant layer c.).

47. The glass-free motor vehicle window according to Claim 46, wherein said hydrophilic/oleophilic agent is obtained from precursor silanes having a hydrolyzable alkoxy- or halo-functional group at one end and a perfluorinated carbon chain at the other end.

48. The glass-free automobile window according to Claim 40, wherein said skin layer b) includes at least one decorative or masking layer or both covering all or part of the surface of the window.

49. The glass-free automobile window according to Claim 40, including at least one adhesion layer between said layer a.) and layer b.).

50. The glass-free automobile window according to Claim 40, wherein the skin layer b.) includes one or more optically selective layers, having thicknesses of between 2 and 35  $\mu\text{m}$  and separated from each other, as well as from other adjacent layers or films, by dielectric layers.

51. The glass-free automobile window according to Claim 50, wherein said optically selective layers are metal layers.

52. The glass-free automobile window according to Claim 40, wherein said scratch resistant layer c.) has a surface appearance without any crazing.

53. A process for preparing a glass-free automobile window which is at least partly transparent, and which meets French standard R43 for motor vehicle windows, which comprises:

a.) a plastic layer having a thickness of 5 to 10 mm,

b.) at least one skin layer of a plastic film having a thickness of 10 to 100  $\mu\text{m}$  coated on said plastic layer, and

c.) a scratch-resistant layer having a thickness of 1 to 10  $\mu\text{m}$  supported by said plastic film, which process comprises:

1.) providing said skin layer b.), either flat or in shaped form,

2.) subjecting said skin layer to heat treatment, the skin layer, being supported completely or partly by a mould surface, an auxiliary means for shaping at least part of the skin to the said mould surface being optionally provided so as to relax stresses in the skin, and crosslinking constituent elements thereof; and

3.) joining the skin to said plastic layer a.) by hot pressing in a form, or by thermoplastic injection moulding or reactive injection moulding of the material of the plastic layer a.), the skin having been positioned in the bottom of the mould in such a way that a scratch-resistant layer c.) is in direct contact with the mould.

54. The process of Claim 53, wherein said constituent elements are supplied by screen printing, flexography, ink jet printing, laser printing, dip coating or spraying.

55. The process of Claim 53, wherein in step 2), said heat treatment is effected at 100° to 300°C.

56. A process for preparing a glass-free automobile window which is at least partly transparent, and which meets French standard R43 for motor vehicle windows, which comprises:

a.) a plastic layer having a thickness of 5 to 10 mm,

b.) at least one skin layer of a plastic film having a thickness of 10 to 100  $\mu\text{m}$  coated on said plastic layer, and

c.) a scratch-resistant layer having a thickness of 1 to 10  $\mu\text{m}$  supported by said plastic film, which process comprises:

1.) depositing the constituent elements of a scratch-resistant layer on a substantially flat plastic film; and

2.) shaping said film bearing the elements of the scratch-resistant layer into a shape which is the same as or at least similar to the ultimate shape of the end-product, while at the same time at least partly crosslinking the scratch-resistant layer.

57. The process of Claim 56, wherein the crosslinking and simultaneous shaping involve a heat treatment at a temperature of from 100 and 300°C.

58. The process of Claim 57, wherein the temperature is from 140 to 240°C.

59. The process of Claim 56, wherein the shaping is carried out by supporting the film coated with the scratch-resistant layer, or the elements intended to constitute this layer, at least on part of its surface, by a mould.

60. The process of Claim 56, wherein the mould carrying the film is a frame open at its center.

61. The process of Claim 56, wherein the film coated with the scratch-resistant layer of elements constituting this layer is combined, before shaping, with one or more other films which themselves fulfill functions or carry means for carrying out these functions other than the scratch-resistance function.

62. A method of incorporating a body element, at least a portion of which is transparent, in a manufactured object, which comprises incorporating the glass-free automobile window according to Claim 40, into an automobile.



63. A glass-free motor vehicle window, which is at least partly transparent, and which meets French standard R43 for motor vehicle windows, which comprises:

- a.) a plastic layer having a thickness of 5 to 10 mm,
- b.) at least one skin layer of a plastic film having a thickness of 10 to 100  $\mu\text{m}$  coated on said plastic layer, and
- c.) a scratch-resistant layer having a thickness of 1 to 10  $\mu\text{m}$  supported by said plastic film,

wherein said scratch-resistant layer c.) is essentially inorganic or consists essentially of networks of entangled inorganic and organic molecular chains linked to each other by silicon-carbon bonds.

64. The glass-free motor vehicle window according to Claim 63, wherein said scratch-resistant layer c.) consists essentially of networks of entangled inorganic and organic molecular chains linked to each other by silicon-carbon bonds.

65. The glass-free motor vehicle window according to Claim 64, wherein said networks of entangled inorganic and organic molecular chains linked to each other by silicon-carbon bonds are provided by an Ormocer varnish.